

# PATENT ABSTRACTS OF JAPAN

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(71)Applicant : NIPPON RIFUOOMU KK  
MITSUI PETROCHEM IND LTD

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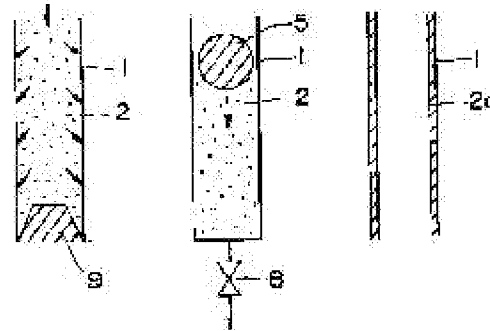
(72)Inventor : TOMOYASU TAKAHARU

## (54) METHOD FOR LINING INNER FACE OF MANIFOLD

### (57)Abstract:

**PURPOSE:** To easily form a coating film in appropriate thickness over the entire pipeline at the time of lining the inner face of the service and drain pipeline for housing by filling the pipeline with a lining material from its one end and extracting the material from the other end.

**CONSTITUTION:** The inner face of a pipeline 1 such as a service water pipe and gas pipe is coated with a lining 2a. In this case, the inner face is cleaned, a lining material 2 is supplied from one end of the pipeline 1 to fill the pipeline 1, and then the material 2 is extracted from the other end. In such treatment, the material 2 is pressed and extended even to all the corners, or a pig 5 is inserted from one end of the pipeline 1 and the pig 5 is pressed by a compressed gas to extrude the material 2 from the pipeline 1. Otherwise, the other end of the pipeline 1 is sucked, the pig 5 is moved forward, and the material 2 is extracted.



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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention relates to the lining method of the charge and discharge pipe way internal surface for residences, and relates to improvement of the lining method of many piping especially.

[0002]

[Description of the Prior Art]Conventionally, the air current method which blows a paint into a pipeline by an air current, and applies a lining material as a method of lining inner surfaces, such as a water pipe and a gas pipe, and the pig painting method which pours in the lining material of an adequate amount ahead of a pig, moves a pig by pneumatic pressure etc., and forms a coat are performed.

[0003]

[Problem(s) to be Solved by the Invention]In said conventional air current method, if the viscosity and air velocity of a paint are selected properly and the good paint of thick \*\*\*\* is used, good lining can be performed.

[0004]However, when it has a branch pipe with a complicated pipeline in this air current method, it is difficult to paint all the pipelines without a holiday. When an air current collides and changes the course into the elbow portion of a pipeline, the operation which extends a coat works strongly and there is a problem that the coat of an elbow portion will become thin.

[0005]And in said conventional pig painting method, since it is easy to produce an air pocket in the joint part of a pipeline, an unpainted portion may occur. Although, as for the thickness of lining, the pipeline internal transmigration speed of a pig also influences, since the movement speed of a pig is influenced by the frictional resistance of a pig and a tube wall, within a pipeline with a large change of the frictional resistance of a pig and a tube wall, there is generally a problem that control of the movement speed of a pig is very difficult.

[0006]This invention is made in view of said matter, and is a thing.

the purpose is to provide the lining method of the line inner surface of many piping which can be alike and continue and can form proper coat thickness.

[0007]

[Means for Solving the Problem]Said purpose can be attained with a lining method of a line inner surface of this invention which extracts a lining material which continued in [ whole ] a pipeline from an end of \*\* pipeline, a lining material was made full, and it was full of in said pipeline from an edge of a winding instrument of a pipeline, and lines a tube interior.

[0008]\*\* After being full of a lining material in said pipeline, a line inner surface can be lined more to fitness by applying a pressure to a lining material in a pipeline.

\*\* A pig is inserted from an end of a pipeline full of said lining material, and inside of a pipeline is advanced and it may be made to extrude a lining material in a pipe by pressing said pig with compression gas.

[0009]And a pig is inserted from one end of a pipeline full of the \*\* aforementioned lining material, the other end side of a pipeline is made into negative pressure by attracting the other end of a pipeline, and said pig may be advanced while extracting said lining material. After inserting a pig from one end of a pipeline, a process of sending in compression gas from one end of a pipeline, and a process of making the other end side of a pipeline into negative pressure may be used together.

[0010]More proper lining can be given, if a discharge of a lining material which it was full of in the \*\* aforementioned pipeline is controlled and the speed of advance of said pig is controlled. In this case, when an inside diameter of the pipeline whole region where a pig advances is equal, by making a discharge of a lining material regularity, the speed of advance of a pig also becomes fixed and can be lined by uniform thickness to a tube interior.

[0011]Although premised on this invention lining at a process of the aforementioned \*\* , a good effect is produced by adding a process of \*\* - \*\* to a process of \*\* further.

[0012]

[Function]After cleaning a line inner surface, it is [ pipeline / whole ] full of a lining material from the end of a pipeline. Next, a lining material is extracted from the edge of a winding instrument of a pipeline, and a line inner surface is lined. With, refer to the above figure 1 (a) - drawing 1 (c).

[0013]After being [ pipeline / whole ] full of a lining material, the other end of a pipeline may be sealed and a pressure may be applied in a pipe from one end of a pipeline. . [ whether a lining material is extruded, while inserting a pig into a pipeline from one end of a pipeline, removing the plug of the other end of a pipeline, sending in compression gas in a pipe from the back (one end of a pipeline) of a pig and making it run a pig, and ] Or while performing the draw of the lining material in a pipe by attracting the other end side which removed the plug, it is made to run a pig, and it may be made to give lining in a pipe.

[0014]The speed of advance in a pipeline of said pig may be controlled by controlling the discharge of the lining material which it was full of in the pipeline. With, refer to the above figure 2 (a) - drawing 2 (e). Thus, according to this invention, all the pipelines can be lined without a holiday. The lining coat of thickness sufficient also in the elbow portion of a pipeline can be given.

[0015]And in order to pressurize the lining material which it was full of in the pipeline, an air pocket does not arise in a pipeline and an unpainted portion does not occur. When making it run a pig in a pipeline, by controlling the discharge of the lining material which it was full of in the pipeline, the speed of advance of a pig can be adjusted and it becomes possible to form the lining coat of the suitable thickness for a line inner surface.

[0016]The lining material used by this invention may be conventionally used with the lining method of the tube interior, and epoxy resin coating etc. are mentioned. The construction material of the pig used by this invention has polyurethane foam, polyvinyl chloride form, latex form, good silicone rubber foam, etc., for example.

[0017]

[Example]Hereafter, one example of this invention is described based on a drawing. Drawing 3 is a figure showing an example of the housing service-water trachea which comprises a main line and a branched pipe.

[0018]The main line 10 is open for free passage in the 1st terminal area 21 and the 2nd terminal area 31 in the portion on the way, respectively with the 1st water supply branch pipes 20 and the 2nd water supply branch pipes 30 which are branched pipes. It is piped as the main line 10a between the opening 11 of the end of the main line 10, and said 1st terminal area 21, and is piped as the main line 10b between said 1st terminal area 21 and said 2nd terminal area 31. And it is piped as the main line 10c between said 2nd terminal area 31 and the opening 12 of the other end of the main line 10.

[0019]The 1st water supply branch pipes 20 have the opening 22 at the end, and the 2nd water supply branch pipes 30 have the opening 32 at the end. After cleaning by the work which sends an abradant in a pipe and grinds the inside of a pipeline by airstream as shown in drawing 2 (a), the lining material 2 is poured in by pneumatic pressure into a pipeline with the paint potting machine 7 from the opening 11 of the main line 10.

[0020]This poured-in lining material 2 runs, filling the inside of a pipeline, for example, reaches the opening 22 of the 1st water supply branch pipes 20 through the 1st terminal area 21 from the main line 10a. The plug 9 is made the opening 22 with a valve or a plug here. Since the lining material 2 reaches the opening 32 of the 2nd water supply branch pipes 30, and the opening 12 of the main line 10c via the 2nd terminal area 31 from the main line 10b one by one, it seals the opening 32 and the opening 12 as well as said opening 22, respectively. It will be in the state where it was full as all the pipelines of the main line 10 and the 1st water supply branch pipes 20, and the 2nd water supply branch pipes 30 were covered and the lining material 2 showed drawing 2 (b) by the above process.

[0021]Next, the air pressure used for lining material pouring from the opening 11 is raised in the range of 0.3 in all kg/cm - 7 kg/cm to the pressure resistance of a pipe, as shown in drawing 2 (c), the lining material 2 which it is full of in a pipeline is pushed even against all the corners of a pipe, and an unpainted portion is lost.

[0022]And the pig 5 which has elasticity by the product made of resin is inserted from the end opening 11 of the main line 10, and the end opening 22 of the 1st water supply branch pipes 20 is opened. Next, if air is sent in in a pipe from the end opening 11 of the main line 10, the pig 5 will advance from the opening 11 through the -> main-line 10a-> 1st terminal area 21 -> 1st water supply branch pipes 20 to the end opening 22 of the -> 1st water supply branch pipes 20, and will be collected from the end opening 22.

[0023]Next, the pig 5 is inserted from the end opening 22 of the 1st water supply branch pipes 20, the end opening 32 of the 2nd water supply branch pipes 30 is opened wide, a little air for prevention of backflow is put in in a pipeline from the end opening 11 of the main line 10, and air is sent in from the end opening 22 of the 1st water supply branch pipes 20. The pigs 5 are collected in the place which passed the -> 2nd water supply branch pipes 30 through the -> 1st water-supply-branch-pipes 20 -> 1st terminal area 21 -> main-line 10b-> 2nd terminal area 31 from the opening 22, and resulted in the end opening 32 of the -> 2nd water supply branch pipes 30.

[0024]While advancing the pig 5 from the end opening 32 of the 2nd water supply branch pipes 30 to the other end opening 12 of the main line 10 similarly and lining all the pipelines, the draw of the lining material 2 of all the pipelines is performed.

[0025]At this time, the discharge of the lining material 2 from a pipeline is controlled by the valve 8 to be shown in drawing 2 (d). That is, since the lining material 2 is filled with the inside of the pipeline of the direction of movement of the pig 5, it can adjust the speed of advance of the pig 5 by controlling the discharge of the lining material 2. That is, the uneven thickness produced from the irregular speed of advance of the pig 5 in a line inner surface will not be lined, and as shown in drawing 2 (e), the lining coat 2a of uniform thickness will be

formed.

[0026]Here, the case where the pipeline which lines is a pipeline with which lining is beforehand made by the vinyl chloride lining material 3 is shown in drawing 4. As shown in a figure, corrosion shaping of the stripping part A is carried out at the fitting portion. In this example, after being filled up with the lining material 2 in a pipeline, since it pressurizes, the lining material 2 is stuffed into said stripping part A, and a reinforcing effect can be done so.

[0027]The case where it lines in the pipe in the state where the pipeline deteriorated and the hole opened to the pipe surface is shown in drawing 5. By filling up with and pressurizing the lining material 2 in a pipeline, where the back plate 6 is applied to the pipe surface of the portion which the breakthrough 4 opened, while the lining material 2 is stuffed into said breakthrough 4 and blockades the breakthrough 4, reinforcement of a corrosion part is made. Therefore, although the problem of it becoming impossible to line by revealing a lining material in a breakthrough portion occurs in the conventional pig painting method the injection rate of the lining material was beforehand decided to be, good lining can be constructed in this example.

[0028]In this example, although pneumatic pressure was used using air on the occasion of the lining material restoration in a pipeline, and application of pressure, inactive gas, such as nitrogen and argon, may be used, for example. You may make it filled up with the lining material 2 in a pipeline using not a pressure but the pump by air or inactive gas.

[0029]And although the requirements of a lining material will increase as compared with a conventional construction method, since a housing service-water trachea and a drainage pipe have the small tube diameter, they turn into the amount of the tolerance level used practical. Since equivalent time shortening of the time which lining takes is carried out as compared with an air current method, this construction method turns into a construction method synthetically cheaper than a conventional construction method.

[0030]

[Effect of the Invention]According to this invention, it becomes possible to provide the lining method of the line inner surface of many piping which can cover the whole pipeline and can form proper coat thickness.

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[Translation done.]

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## CLAIMS

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[Claim(s)]

[Claim 1]A lining method of a line inner surface of many piping which extracts a lining material which continued in [ whole ] a pipeline from an end of a pipeline, a lining material was made full, and it was full of in said pipeline from an edge of a winding instrument of a pipeline, and lines a tube interior.

[Claim 2]A lining method of a line inner surface of said many piping according to claim 1 characterized by applying a pressure to a lining material in a pipeline after being full of a lining material in said pipeline.

[Claim 3]A lining method of a line inner surface of said many piping according to claim 1 or 2 which inserts a pig from an end of a pipeline full of said lining material, advances inside of a pipeline by pressing said pig with compression gas, and extrudes a lining material in a pipe.

[Claim 4]Insert a pig from one end of a pipeline full of said lining material, and the other end side of a pipeline is made into negative pressure by attracting the other end of a pipeline, A lining method of a line inner surface of said many piping according to any one of claims 1 to 3 advancing said pig while extracting said lining material.

[Claim 5]A lining method of a line inner surface of said many piping according to claim 3 or 4 controlling the speed of advance of said pig by controlling a discharge of a lining material which it was full of in said pipeline.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1](a) The figure showing the state where it cleaned to the pipeline

(b) The state \*\*\*\* figure which was [ pipeline ] full of the lining material

(c) The figure showing the state where the lining material was extracted from the pipeline

[Drawing 2](a) The figure showing the state where it cleaned to the pipeline

(b) The figure showing the state where it was [ pipeline ] full of the lining material

(c) The figure showing the state where the inside of the pipeline full of a lining material was pressurized

(d) The figure showing the state where a pig runs in the pipeline full of a lining material

(e) The figure showing the state where the lining material was discharged from the pipeline

[Drawing 3]The figure showing the example which carries out this invention in the pipeline which has a branch pipe

[Drawing 4]The sectional view showing the case where the stripping part has arisen into the fitting portion, in an example

[Drawing 5]The figure showing a lining state when the hole is open to the pipe surface in an example

[Description of Notations]

1 .. Pipeline

2 .. Lining material

2a .. Lining coat

3 .. Vinyl chloride lining material

4 .. Breakthrough

5 .. Pig

6 .. Back plate

7 .. Paint potting machine

8 .. Valve

9 .. Plug

10, 10a, 10b, 10c .. Main line

11 .. (main-line end) Opening

12 .. (main-line other end) Opening

20 .. The 1st water supply branch pipes

21 .. The 1st terminal area

22 .. (the 1st water-supply-branch-pipes end) Opening

30 .. The 2nd water supply branch pipes

31 .. The 2nd terminal area

32 .. (the 2nd water-supply-branch-pipes end) Opening

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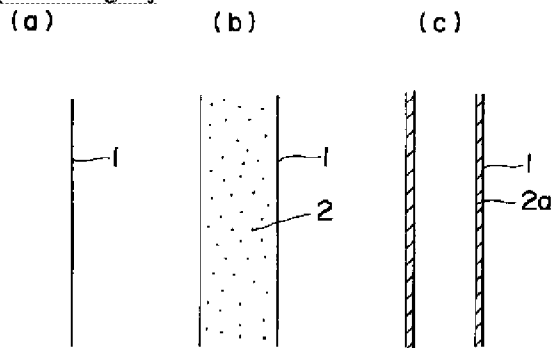
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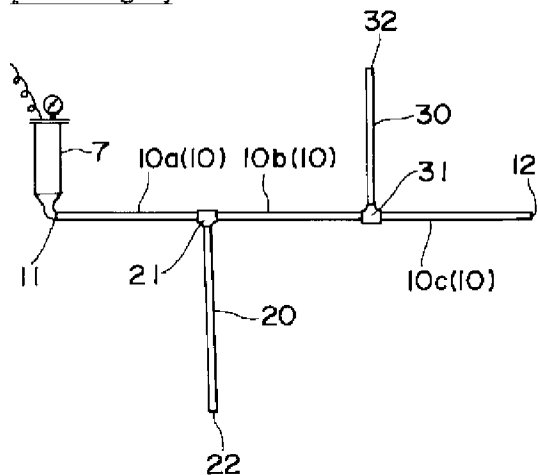
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## DRAWINGS

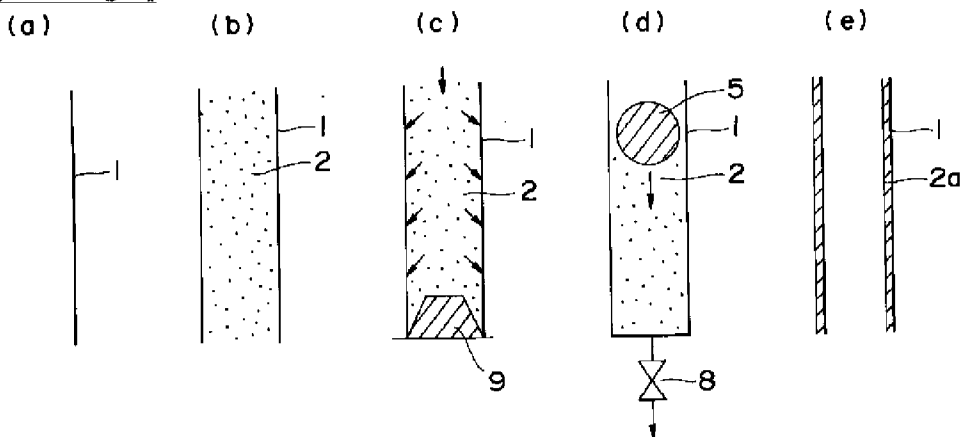
[Drawing 1]



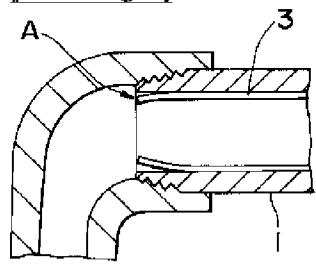
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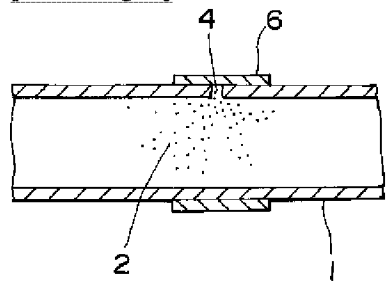
[Drawing 2]



[Drawing 4]



[Drawing 5]



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